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Applicant: Daniel N. Duncan, Alexander N. Svoronos, Thomas J. Miller
Assignee: Austin Logistics Incorporated
Title: Method and System for Scheduling Inbound Inquiries
Serial No.: 09/547,627 Filed: April 12, 2000
Examiner: B. Bui Group Art Unit: 2642
Docket No.: 066416.0103

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APPEAL BRIEF UNDER 37 CFR § 1.191

Dear Sir:

Applicants submit this Appeal Brief pursuant to the Notice of Appeal filed in this case on June 6, 2002.

A check is enclosed in the amount of \$160.00 being the amount specified in 37 C.F.R. 1.17(c) for this Appeal Brief. The Commissioner is authorized to deduct any other amounts required for this appeal brief and to credit any amounts overpaid to Deposit Account No. 502264. This paper is submitted in triplicate.

I. Real Party in Interest

The real party in interest is the assignee, Austin Logistics Incorporated as named in the caption above.

II. Related Appeals and Interferences

Based on information and belief, there are no appeals or interferences that could directly affect or be directly affected by or have a bearing on the decision by the Board of Patent Appeals in the pending appeal.

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III. Status of Claims

Claims 1 - 50 are pending in the application. Claims 1 - 50 have been rejected. No claims have been withdrawn from consideration, allowed, objected to or are subject to a restriction and/or election requirement.

IV. Status of Amendments

A Response to Office Action was filed on June 6, 2002 in response to a final Office Action dated April 10, 2002. An Advisory Action was issued by the examiner on July 5, 2002 denying entry of the Response to Office Action.

V. Summary of the Invention

Inbound inquiries, such as telephone calls by individuals to a calling center, are handled in an order based on the forecasted or probable outcome of each inbound inquiry. Outcomes are predicted with models that apply caller information associated with each inbound inquiry. For instance, statistical analysis of historical caller information using linear or logistic regression develops models in which the caller information acts as predictive variables for defined caller behaviors, such as the probability that a telephone call will result in a purchase or the probability that the caller associated with the telephone call will terminate the call after a hold time. The order for answering inbound inquiries may optimize a desired result, such as maximizing sales or minimizing caller attrition, by solving a constrained optimization problem.

VI. Issue

Whether claim 1 is unpatentable under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Whether claims 1, 3 - 35, 37 - 44 and 46 are unpatentable under 35 U.S.C. § 102 over Walker et al (U.S. Patent No. 6,088,444).

Whether claims 48-50 are unpatentable under 35 U.S.C. § 103 over Walker et al (U.S. Patent No. 6,088,444) in view of Gisby (U.S. Patent No. 6,002,760) or Jolissaint (U.S. Patent No. 5,040,208).

VII. Grouping of the Claims

The claims do not stand or fall together. The claims subject to the same rejection are separately patentable.

VIII. Arguments

A. Rejection of Claim 1 under 35 U.S.C. § 112, second paragraph.

Claim 1 stands rejected as indefinite. Claim 1 recites in part:

applying a model to the inquiry information to determine a priority value for each inquiry, the model estimating the probability of an inbound inquiry having a predetermined result.

The Examiner equated the term “inbound inquiry” to the term “telephone call,” and then stated, “The probability of a telephone call is vague unless probability of something of the telephone call, probability of completion of a telephone call for example.” (April 10, 2002 Office Action at 2).

Applicants respectfully submit that Claim 1 is definite as required by Section 112, paragraph 1. The plain language of Claim 1 recites that the model estimates the probability of an inbound inquiry “having a predetermined result,” i.e., that an inbound inquiry will have a predetermined result. This language is consistent with the written description which, for instance, identifies logistic regression as one type of statistical analysis to define models to estimate the probability of results of inbound inquiries as discrete outcomes. (pg. 19, line 13) Therefore, Applicants respectfully submit that Claim 1 is allowable.

In a Response to Final Office Action filed by Applicants on June 6, Claim 1 was amended to recite:

the model estimating the probability of an outcome of an inbound inquiry having a predetermined result.

However, the Examiner refused to enter the amendment. Applicants respectfully submit that, should the board find Claim 1 indefinite, the amendment submitted by Applicants on June 6 overcomes the rejection without requiring a new search and should thus be entered. Therefore, Applicants respectfully request that, should the Board affirm the Examiner’s rejection of Claim 1

as indefinite, then the Board direct the Examiner to enter the June 6 amendment and allow Claim 1.

B. Rejections under 35 U.S.C. § 102(e).

Claims 1, 3-35, 37-44 and 46 stand rejected under 35 § 102(e) as anticipated by U.S. Patent No. 6,088,444 issued to Walker. In order to anticipate Applicants' claimed invention, Walker must disclose "each and every element as set forth in the claim [] either expressly or inherently described." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if the missing element is "inherent" in its disclosure. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269 (quoting *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981)).

Walker discloses a system that prioritizes incoming telephone calls based on "economic value." The economic value is computed from information input by a caller through an interactive voice response unit ("IVR"). Economic value is calculated from the total number of items ordered by a caller by IVR inputs, a total dollar amount of the order and/or profitability of the order and the status of the customer. (Walker, 3:64 – 4:8). The status of a customer indicates the customer's level of importance based on the amount of past purchases or the originating location of the call. (Walker 3:67-4:5) In a telephone conference, the Examiner stated that he equated the "customer status" of Walker to a model.

1. Group 1, Independent Claims 1, 16, 33, 39 and 44

Applicants respectfully submit that Walker cannot anticipate independent Claims 1, 16, 33, 39 or 44 because Walker fails to teach, disclose or suggest all elements recited by these claims. Accordingly, Applicants respectfully request the Board to reverse the Examiner's rejections based on Walker.

Claim 1 as amended recites "applying a model to the inquiry information to determine a priority value for each inquiry, the model estimating the probability of an inbound inquiry having a predetermined result."

Claim 16 recites "applying the model to caller information of a pending inbound call to predict an outcome of the pending inbound call."

Claim 33 recites a "scheduling module operable to order the inbound inquiries . . . based in part on the predicted outcome of the inbound inquiries."

Claim 39 recites "a scheduling module that prioritizes the inbound calls in accordance with forecasted outcomes for the inbound calls."

Claim 44 recites "applying the inquiry information to one or more models to determine a priority value for each inquiry."

Walker clearly does not explicitly disclose a method or system that models inbound inquiry outcomes. Walker nowhere mentions the use of models, the estimation of probabilities or the forecasting of outcomes of inbound inquiries. Indeed, Walker has no need to predict outcomes since Walker queues inbound calls based on an economic value input by callers. In other words, Walker does not have to predict whether a caller will make a purchase since the caller has already selected desired purchases through the IVR. Walker merely queues calls based on the purchases selected by the caller. For instance, Walker simply adds up the dollar value of an order input by a caller and then queues higher-dollar-value inbound calls to be answered before calls that order lesser amounts. Therefore, Walker has no need to predict the probability of a purchase since the caller has already input the purchase.

In a telephone call with Applicants' attorney, the Examiner conceded that Walker does not explicitly describe the use of models. Instead, the Examiner relied on the customer status of Walker as inherently disclosing a model that uses probability to order calls. Applicants respectfully disagree. Walker nowhere provides any description of how customer status is used to calculate an economic value as a quantity. The Examiner postulated in the phone conference that Walker inherently uses large past purchases of a customer to calculate an increased probability of future purchases, however, Walker has no such disclosure. Indeed, Walker has no need to predict the probability of a purchase since the customer has already input any desired purchases. Walker includes only a single example of the use of past purchases in which a customer that makes 6 \$100 purchases has a higher status than a customer who makes a single

\$200 purchase. This example does not inherently disclose a model that predicts an outcome of a call since the history does not necessarily indicate a higher purchase probability. For instance, with reference to Walker's example of airline tickets (5:65-6:8), a customer who recently purchased airline tickets may very well be less likely to desire the purchase of additional tickets as opposed to changing a flight schedule.

Since Walker fails to teach, disclose or suggest, either expressly or inherently, the use of a model, the use of estimates of probability or the forecasting of outcomes, Walker cannot anticipate Independent Claims 1, 16, 33, 39 or 44. Thus, Applicants respectfully request that the Board direct the Examiner to allow Claims 1-47.

2. *Group II, Claims 10 and 27*

The Examiner rejected Claims 10 and 27 as anticipated by Walker. Claim 10 recites a method wherein "the priority value comprises a probability that the telephone call will result in a purchase." Claim 27 recites a method wherein "the predicted outcome comprises a purchase resulting from the pending inbound call." Claims 10 and 27 are separately patentable for the recitation that a model predicts the specific outcome of a probability of a purchase. Walker cannot anticipate Claims 10 and 27 because Walker does not determine the probability of a purchase. Indeed, Walker has no need to compute probability of purchase since the caller has already input the items that the caller desired to purchase. Accordingly, Applicants respectfully request that the Board direct the Examiner to allow Claims 10 and 27.

3. *Group III, Claims 11 and 28*

The Examiner rejected Claims 11 and 28 as anticipated by Walker. Claim 11 recites a method wherein "the probability that the caller associated with the telephone call will terminate the call after a hold time." Claim 28 recites a method wherein "the predicted outcome comprises the hold time of the pending inbound call." Claims 11 and 28 are separately patentable for the recitation that a model predicts the specific outcome of a call termination hold time. Walker cannot anticipate Claims 10 and 27 because Walker does not determine the probability of a termination or a probable hold time for a caller. Indeed, Walker makes no mention at all of hold time. Accordingly, Applicants respectfully request that the Board direct the Examiner to allow Claims 10 and 27.

4. *Group IV, Claims 13, 24 and 25*

The Examiner rejected Claims 13, 24 and 25 as anticipated by Walker. These claims each have a limitation for the specific modeling technique used, respectively claimed as regression analysis, logistic regression and linear regression. Claims 13, 24 and 25 are separately patentable for the recitation of specific model techniques. As the Examiner has admitted, Walker fails to explicitly disclose modeling and therefore also fails to disclose examples of modeling techniques. Accordingly, Applicants respectfully request that the Board direct the Examiner to allow Claims 13, 24 and 25.

5. *Group V, Claims 30-32 and 42-43*

The Examiner rejected Claims 30-32 and 42-43 as anticipated by Walker. These claims each have limitations relating to the optimization of the order for handling inbound inquiries. Optimization applies models to optimize for a desired result, such as maximum purchases or minimum caller attrition. (See written description starting at pg. 23, line 17) Walker fails to teach, disclose or suggest any optimization of results for queuing of inbound inquiries. Indeed, Walker makes no mention at all of optimization. Accordingly, Applicants respectfully request that the Board direct the Examiner to allow Claims 30-32 and 42-43.

C. Rejections under 35 U.S.C. § 103(a).

Claims 48-50 stand rejected under 35 § 103(a) as obvious over Walker in view of U.S. Patent No. 6,002,760 issued to Gisby or U.S. Patent No. 5,040,208 issued to Jolissaint. For each rejection under Section 103, the Examiner relies upon Walker as disclosing the use of a model to determine a priority value. As described above, Walker fails to teach disclose or suggest the use of a model. Accordingly, Applicants respectfully request that the Board direct the Examiner to allow Claims 48-50.

IX. Conclusion

For the above reasons, Applicant respectfully submits that rejection of pending Claims 1 - 50 is unfounded. Accordingly, Applicant requests that the rejection of claims 1 - 50 be reversed.

This paper is submitted in triplicate.

I hereby certify that this correspondence is being deposited with
the United States Postal Service as First Class Mail in an envelope
addressed to: COMMISSIONER FOR PATENTS, Washington,
D.C. 20231, on August 6, 2002.



Attorney for Applicant

6 Aug, 2002
Date of Signature

Respectfully submitted,



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APPENDIX

1. (Twice Amended) A method for ordering inbound inquiries, the method comprising:
 - receiving plural inbound inquiries, each inbound inquiry having associated inquiry information;
 - applying a model to the inquiry information to determine a priority value for each inquiry, the model estimating the probability of an inbound inquiry having a predetermined result; and
 - ordering the inbound inquiries with the priority values.
2. The method of Claim 1 wherein the method inquiries comprise e-mail messages.
3. The method of Claim 1 wherein the method inquiries comprise instant messages.
4. The method of Claim 1 wherein the inbound inquiries comprise inbound telephone calls having associated caller information.
5. The method of Claim 4 wherein the caller information comprises automatic number identification information.
6. The method of Claim 4 wherein the caller information comprise destination number identification information.

7. The method of Claim 4 further comprising:

gathering the caller information with a voice response unit.

8. The method of Claim 4 further comprising:

associating demographic information with each inbound telephone call based on the caller information of the inbound call; and

applying the model to the caller information to determine the priority value for each telephone call.

9. The method of Claim 4 wherein the model predicts caller behavior.

10. The method of Claim 9 wherein the priority value comprises a probability that the telephone call will result in a purchase.

11. The method of Claim 9 wherein the priority value comprises a probability that the caller associated with the telephone call will terminate the call after a hold time.

12. The method of Claim 1 further comprising:

developing plural models from a history of inbound inquiries to forecast plural outcomes that determine the priority value.

13. The method of Claim 12 wherein developing the model further comprises:

applying regression analysis to the history to calculate the priority value.

14. The method of Claim 12 further comprising:

determining the outcomes of the plural inbound inquiries; and

updating the history with the outcomes of the plural inbound inquiries.

15. The method of Claim 12 wherein developing the caller model further comprises:

updating the model with the updated history.

16. A method for determining inbound telephone call priority, the method

comprising:

developing one or more models from a history of inbound calls, the history having caller information and outcome results from inbound telephone calls;

applying the model to caller information of a pending inbound call to predict an outcome of the pending inbound call; and

associating a priority with the pending inbound call, the priority based on the predicted outcome.

17. The method of Claim 16 wherein the caller information comprises telephony

information received with the pending inbound call.

18. The method of Claim 17 wherein the telephony information comprises automatic

number identification information.

19. The method of Claim 17 wherein the telephony information comprises destination number identification information.

20. The method of Claim 17 wherein the caller information further comprises account information, the method further comprising:

obtaining account information for the pending inbound call, the account information stored in a database by association with the telephony information.

21. The method of Claim 17 wherein the telephony information further comprises information input by the caller through a voice response unit.

22. The method of Claim 21 further comprising:

obtaining account information for the pending inbound call based on the telephony information.

23. The method of Claim 16 wherein developing a model further comprises: using the caller information as predictive variables that model outcome results.

24. The method of Claim 23 wherein the model comprises a logistic regression model.

25. The method of Claim 23 wherein the model comprises a linear regression model.

26. The method of Claim 16 further comprising:

placing the pending inbound call in the queue of an automatic call distribution system in an order based on the priority of the pending inbound call.

27. The method of Claim 26 wherein the predicted outcome comprises a purchase

resulting from the pending inbound call.

28. The method of Claim 26 wherein the predicted outcome comprises the hold time

of the pending inbound call.

29. The method of Claim 16 wherein associating a priority further comprises

optimizing the order for the inbound telephone calls.

30. The method of Claim 29 wherein optimizing the order comprises solving a

constrained optimization problem using one or estimates from one or more models.

31. The method of Claim 29 wherein optimizing further comprises maximizing agent

productivity to minimize caller attrition.

32. The method of Claim 29 wherein optimizing further comprises maximizing agent

productivity to produce sales.

33. (Previously Amended) A system for scheduling inbound calls, the system comprising:

a receiving device operable to receive plural inbound inquiries and to provide the inbound inquiries to one or more agents; and

a scheduling module interfaced with the receiving device, the scheduling module operable to order the inbound inquiries for handling by the receiving device, the order based in part on the predicted outcome of the inbound inquiries.

34. The system of Claim 33 wherein the inbound inquiries comprise inbound telephone calls.

35. The system of Claim 33 wherein the receiving device comprises an automatic call distribution system.

36. The system of Claim 33 wherein the receiving device comprises a server that supports voice over internet protocol.

37. The system of Claim 33 wherein the receiving device comprises a voice response unit.

38. The system of Claim 34 further comprising:

an inbound call history data base operable to store outcome results and caller information from plural completed inbound calls; and

a modeling module interfaced with the history database and operable to model inbound call outcomes from the stored outcome results and caller information.

39. A system for responding to inbound calls, the system comprising:

a telephone call receiving device interfaced with a network to receive plural inbound calls; and

a scheduling system associated with the receiving device and having a scheduling module that prioritizes the inbound calls in accordance with forecasted outcomes for the inbound calls; wherein the scheduling system places one or more inbound calls on hold and then releases the inbound call from hold based on the priority of the inbound call.

40. The system of Claim 39 wherein the telephone call receiving device comprises an automatic call distribution system that incorporates the scheduling system.

41. The system of Claim 39 wherein the scheduling system forecasts outcomes with a model derived from a history of inbound calls.

42. The system of Claim 39 wherein the scheduling system orders the inbound calls to optimize an objective function.

43. The system of Claim 42 wherein the objective function comprises agent productivity to minimize inbound call attrition.

44. A method for ordering inbound inquiries, the method comprising:
- receiving plural inbound inquiries, from plural inquiry media, each inbound inquiry having associated inquiry information;
- applying the inquiry information to one or more models to determine a priority value for each inquiry; and
- ordering the inbound inquiries with the priority values.
45. The method of Claim 44 wherein the plural media comprise telephone calls and e-mail messages.
46. The method of Claim 45 wherein the plural media further comprise instant messages.
47. The method of Claim 45 wherein the plural media further comprise voice of internet protocol.
48. (Previously Amended) A method for ordering inbound inquiries, the method comprising:
- receiving plural inbound inquiries, from plural inquiry media, each inbound inquiry having associated inquiry information;
- applying the inquiry information to one or more models to determine a priority value for each inquiry;
- ordering the inbound inquiries with the priority values; and

scheduling one or more inbound inquiries for an outbound contact attempt at a time based on the priority of the inbound inquiry.

49. (Previously Amended) A method for ordering inbound inquiries, the method comprising:

receiving plural inbound inquiries, from plural inquiry media, each inbound inquiry having associated inquiry information;

applying the inquiry information to one or more models to determine a priority value for each inquiry;

ordering the inbound inquiries with the priority values; and

informing the inbound inquirer of the time of the outbound contact attempt.

50. (Previously Amended) A method for ordering inbound inquiries, the method comprising:

receiving plural inbound inquiries, from plural inquiry media, each inbound inquiry having associated inquiry information;

applying the inquiry information to one or more models to determine a priority value for each inquiry;

ordering the inbound inquiries with the priority values;

asking the inbound inquirer for a channel and time for a response; and

scheduling a response at the channel and time.